Probar usando las propiedades de los determinantes.

$$\begin{vmatrix} 1 & x & x(x^2 - 1) \\ 1 & y & y(y^2 - 1) \\ 1 & z & z(z^2 - 1) \end{vmatrix} = \begin{vmatrix} y + z & x & yz \\ x + z & y & xz \\ x + y & z & xy \end{vmatrix}$$

Solución.

Solution.
$$\begin{vmatrix} y+z & x & yz \\ x+z & y & xz \\ x+y & z & xy \end{vmatrix} = \begin{vmatrix} c_{12}(1) \cdot \begin{pmatrix} y+z & x & yz \\ x+z & y & xz \\ x+y & z & xy \end{vmatrix} = \begin{vmatrix} 1 & x & yz \\ 1 & y & xz \\ 1 & z & xy \end{vmatrix} = \begin{vmatrix} 1 & x(x+y+z) & yz \\ 1 & y & xz \\ 1 & z & xy \end{vmatrix}$$

$$= (x+y+z) \cdot \begin{vmatrix} 1 & x & yz \\ 1 & y & xz \\ 1 & z & xy \end{vmatrix} = \begin{vmatrix} 1 & x(x+y+z) & yz \\ 1 & y(x+y+z) & xz \\ 1 & z(x+y+z) & xy \end{vmatrix}$$

$$= \begin{vmatrix} 1 & x^2 + xy + xz & yz \\ 1 & y^2 + xy + yz & xz \\ 1 & z^2 + xz + yz & xy \end{vmatrix} = \begin{vmatrix} c_{23}(1) \cdot \begin{pmatrix} 1 & x^2 + xy + xz & yz \\ 1 & y^2 + xy + xz + yz & xz \\ 1 & z^2 + xz + yz & xy \end{vmatrix}$$

$$= \begin{vmatrix} 1 & x^2 + xy + xz + yz & yz \\ 1 & y^2 + xy + xz + yz & xz \\ 1 & z^2 + xy + xz + yz & xz \end{vmatrix}$$

$$= \begin{vmatrix} 1 & x^2 & yz \\ 1 & y^2 & xz \\ 1 & z^2 & xy \end{vmatrix}$$

$$= \begin{vmatrix} 1 & x^2 & yz \\ 1 & z^2 & xy \end{vmatrix}$$

$$= xyz \cdot \begin{vmatrix} 1 & x^2 & \frac{1}{x} \\ 1 & y^2 & \frac{1}{y} \\ 1 & z^2 & \frac{1}{z} \end{vmatrix}$$

$$= yz \cdot \begin{vmatrix} x & x^3 & 1 \\ 1 & y^2 & \frac{1}{y} \\ 1 & z^2 & \frac{1}{z} \end{vmatrix}$$

$$= z \cdot \begin{vmatrix} x & x^3 & 1 \\ y & y^3 & 1 \\ 1 & z^2 & \frac{1}{z} \end{vmatrix}$$

$$= \begin{vmatrix} x & x^{3} & 1 \\ y & y^{3} & 1 \\ z & z^{3} & 1 \end{vmatrix} = \begin{vmatrix} C_{21}(-1) \cdot \begin{pmatrix} x & x^{3} & 1 \\ y & y^{3} & 1 \\ z & z^{3} & 1 \end{vmatrix}$$

$$= \begin{vmatrix} x & x^{3} - x & 1 \\ y & y^{3} - y & 1 \\ z & z^{3} - z & 1 \end{vmatrix} = \begin{vmatrix} x & x(x^{2} - 1) & 1 \\ y & y(y^{2} - 1) & 1 \\ z & z(z^{2} - 1) & 1 \end{vmatrix}$$

$$= - \begin{vmatrix} C_{23} \cdot \begin{pmatrix} x & x(x^{2} - 1) & 1 \\ y & y(y^{2} - 1) & 1 \\ z & z(z^{2} - 1) & 1 \end{vmatrix} = - \begin{vmatrix} x & 1 & x(x^{2} - 1) \\ y & 1 & y(y^{2} - 1) \\ z & 1 & z(z^{2} - 1) \end{vmatrix}$$

$$= \begin{vmatrix} C_{12} \cdot \begin{pmatrix} x & 1 & x(x^{2} - 1) \\ y & 1 & y(y^{2} - 1) \\ z & 1 & z(z^{2} - 1) \end{vmatrix} = \begin{vmatrix} 1 & x & x(x^{2} - 1) \\ 1 & y & y(y^{2} - 1) \\ 1 & z & z(z^{2} - 1) \end{vmatrix}$$

$$\therefore \text{ Queda demostrado } \begin{vmatrix} 1 & x & x(x^{2} - 1) \\ 1 & y & y(y^{2} - 1) \\ 1 & z & z(z^{2} - 1) \end{vmatrix} = \begin{vmatrix} y + z & x & yz \\ x + z & y & xz \\ x + y & z & xy \end{vmatrix}$$

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En Mahrie elemental del Tipo : Fisicio I

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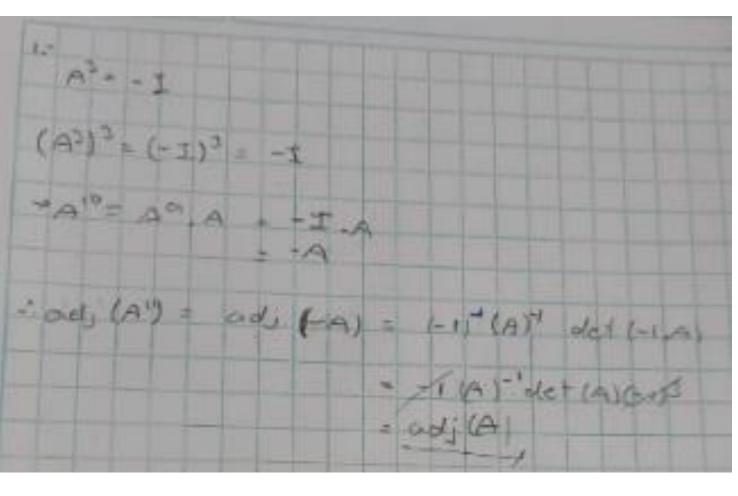
B. (1) E. (-1) E (1) E (1) E (1) E (1)

En: Motors elemental del tipo Fixed I

$$A = F_{12}F_{23}(1)F_{2}(1)F_{2}(1)F_{13}(2).I \qquad B = \begin{cases} 1 & 1 & 1 & 1 \\ 2 & 3 & 2 & -4 \\ 1 & 2 & 6 & 5 \\ 3 & 241 & 3 & 6 \end{cases}$$

$$A = F_{13}(-2)F_{2}(3)F_{23}(4)F_{12}.I \qquad B = \begin{cases} 1 & 4 & 1 & 1 \\ 2 & 3 & 2 & -4 \\ 1 & 2 & 6 & 5 \\ 3 & 241 & 3 & 6 \end{cases}$$

$$A = A_{1}B = \begin{cases} 0.1 & 0.0 &$$



Para qué valores de ay b al rango AB será 5,4,3,251.

range de A.B = min {A}B}

$$A^{\frac{1}{2}} \begin{pmatrix} 2 & 2 & 0 & 0 & 0 \\ 2 & 3 & 2 & 0 & 0 \\ 2 & b & b & 2 & 0 \\ 0 & 0 & b & 3 & 2 \\ 0 & 0 & 0 & 2 & 2 \end{pmatrix} \begin{pmatrix} 2 & 2 & 0 & 0 & 0 \\ 0 & 1 & 2 & 0 & 0 \\ 0 & b^{-2} & b & 2 & 0 \\ 0 & 0 & b & 3 & 2 \\ 0 & 0 & 0 & 3 & 2 \\ 0 & 0 & 0 & 3 & 2 \end{pmatrix} \begin{pmatrix} 2 & 2 & 0 & 0 & 0 \\ 0 & 1 & 2 & 0 & 0 \\ 0 & b^{-2} & b & 2 & 0 \\ 0 & 0 & b & 3 & 2 \\ 0 & 0 & 0 & 3 &$$

20) valores de by à que vuelvan la matriz à r(AB) = 3 v r(AB) = 4

$$A = \begin{bmatrix} 2 & 2 & 0 & 0 & 0 \\ 2 & 3 & 2 & 0 & 0 \\ 3 & 6 & 6 & 20 \\ 0 & 0 & 6 & 32 \\ 0 & 0 & 0 & 2 \end{bmatrix}, B = \begin{bmatrix} 2 - 1 & 0 & 0 & 0 \\ -1 & 2 - 1 & 0 & 0 \\ 0 & 0 - 1 & 2 - 1 & 0 \\ 0 & 0 & 0 - 1 & 2 \end{bmatrix},$$

$$|B| = \begin{vmatrix} 7 - 1 & 0 & 0 & 0 \\ 0 & 3 /_{2} - 3 /_{2} & 0 & 0 \\ 0 & 0 & 1 - 10 & 0 \\ 0 & 0 & 0 & 1 - 1 \\ 0 & 0 & 0 & 0 & 1 \end{vmatrix}$$

$$|B| = \begin{vmatrix} 3 /_{2} & (1) & 2 & 2 & 0 & 0 \\ 0 & 1 & 2 & 0 & 0 \\ 0 & 0 & 0 & 3 & 2 \\ 0 & 0 & 0 & 0 & 2 & 2 \end{vmatrix}$$

$$|B| = \begin{vmatrix} 3 /_{2} & (1) & 2 & 2 & 0 & 0 \\ 0 & 1 & 2 & 0 & 0 \\ 0 & 0 & 0 & 2 & 2 \\ 0 & 0 & 0 & 0 & 2 & 2 \end{vmatrix}$$

$$|B| = \begin{vmatrix} 3 /_{2} & (1) & 2 & 2 & 0 & 0 \\ 0 & 1 & 2 & 0 & 0 \\ 0 & 0 & 0 & 2 & 2 \\ 0 & 0 & 0 & 0 & 2 & 2 \end{vmatrix}$$

$$|B| = \begin{vmatrix} 3 /_{2} & (1) & 2 & 2 & 0 & 0 \\ 0 & 1 & 2 & 0 & 0 \\ 0 & 0 & 0 & 2 & 2 \\ 0 & 0 & 0 & 0 & 2 & 2 \end{vmatrix}$$

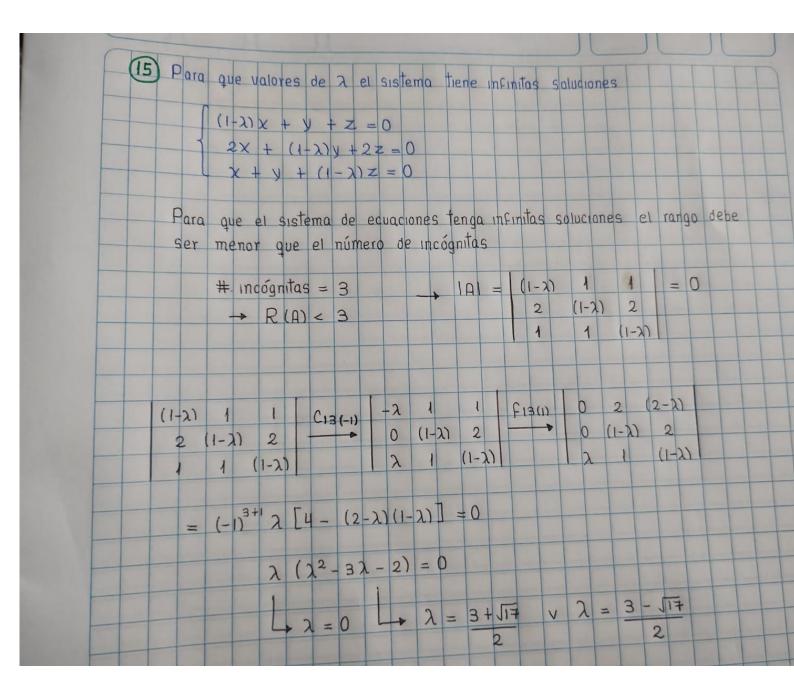
$$m = 7 - 2\left(\frac{14-b}{12-5b}\right) = \frac{24-10b-42+2b}{12-5b}$$

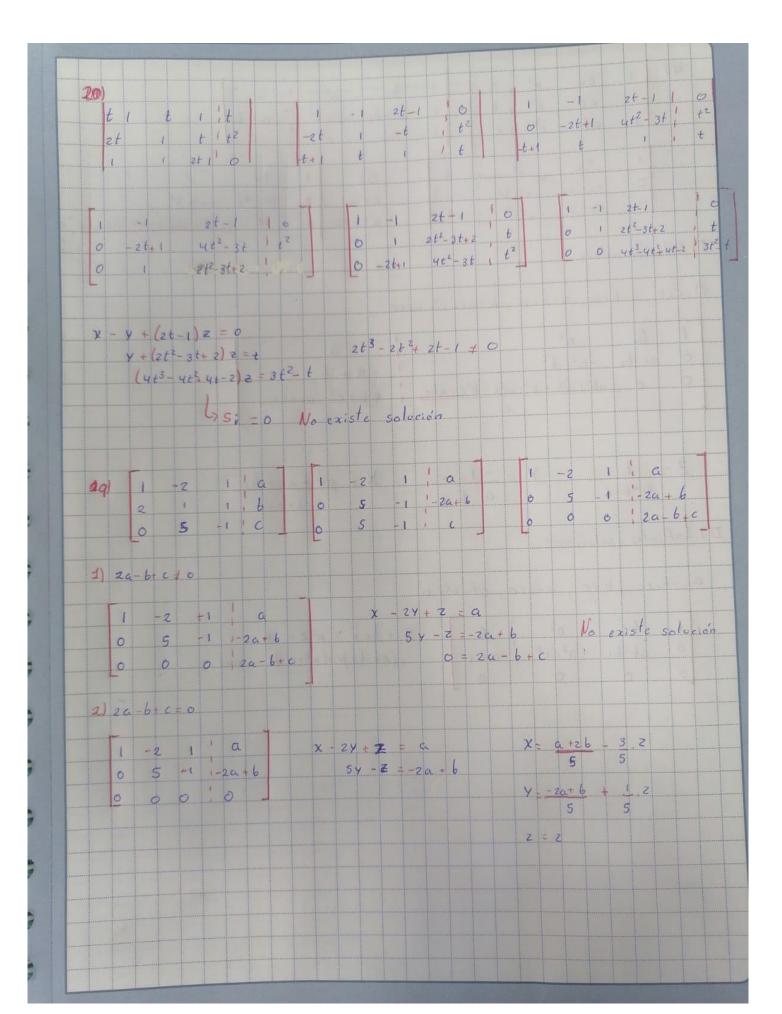
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6) i) 
$$A = \begin{bmatrix} 1 & 1 & 0 & 1 \\ 3 & 2 & -1 & 3 \\ m & 3 & -2 & 0 \\ -1 & 0 & -4 & 3 \end{bmatrix} : \Gamma(A) = 4 \leftrightarrow |A| = 3 \leftrightarrow |$$

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## Universidad nacional de ingeniería

Facultad de ingeniería económica, estadística y ciencias sociales Escuela profesional de ingeniería económica



Segundo Trabajo

Curso: Álgebra Lineal

**Profesor: Mejia** 

**Alumno: Saucedo Batallanos Marlon Nilo**